

AD-A173 773

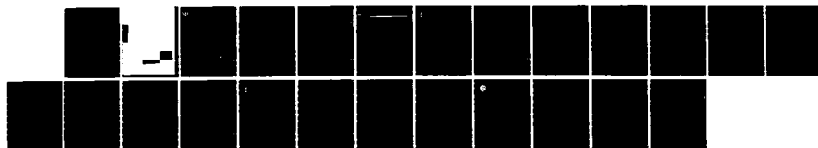
ARMY STUDY HIGHLIGHTS VOLUME 7(U) ARMY CHIEF OF STAFF
WASHINGTON DC STUDY PROGRAM MANAGEMENT OFFICE SEP 86

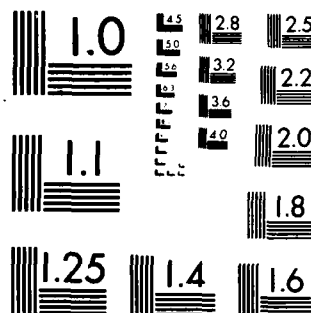
1/1

UNCLASSIFIED

F/G 5/1

NL





MICROCOPY RESOLUTION TEST CHART
NATIONAL BUREAU OF STANDARDS-1963-A

AD-A173 773

This document has been approved
for public release and sale; its
distribution is unlimited.



DEPARTMENT OF THE ARMY
OFFICE OF THE CHIEF OF STAFF
WASHINGTON, D.C. 20310-0200

2

DACS-DMO

24 September 1986

SUBJECT: Army Study Highlights

SEE DISTRIBUTION

1. This year eight recently completed high-quality Army studies were selected for inclusion in Volume VII of the Army Study Highlights. The purpose of this publication is to encourage excellence in the Army analysis community and to acknowledge work well done by deserving individual analysts.
2. The studies contained in this document represent examples of efforts that were technically and professionally conducted and are of significance to the Army's missions. Because of the lessons to be learned in reviewing these studies, I urge you to make the widest possible distribution of this report throughout your organization.
3. Your comments, suggestions, and/or requests for additional copies of the Army Studies Highlights should be directed to Ms. Gloria Brown of this office, AV 227-0026/(C) 697-0026.


JOANN H. LANGSTON, SES, Director
Study Program Management Office
Management Directorate

DTIC
ELECTE
S OCT 28 1986
A

This document is for the use of the Army only. It is not to be distributed outside the Army.

DACS-DMO
SUBJECT: Army Study Highlights

24 September 1986

DISTRIBUTION:

COPIES

OFFICE, SECRETARY OF DEFENSE (ATTN: MAIL AND RECORDS)	2
HQDA (ATTN: SAUS, Mr. W. Hollis)	1
HQDA (ATTN: SAUS-OR, Mr. D. Lester)	2
HQDA (ATTN: SAUS-OR, Dr. D. Willard)	2
HQDA (ATTN: SAMR, Ms. Miller)	2
HQDA (ATTN: SAPA-ZD, Mr. Donovan)	2
HQDA (ATTN: SARDA, Mr. S. Burdt)	2
HQDA (ATTN: SAIL, Ms. E. Burroughs)	2
HQDA (ATTN: DAMU-ZD, Mr. M. Davis)	7
HQDA (ATTN: DAPE-ZBR, Mr. R. Klemmer)	5
HQDA (ATTN: DAIM-FC, Mr. Leipertz)	2
HQDA (ATTN: DAMA-ER, LTC Willis)	5
HQDA (ATTN: DALO-PLF, Mr. D. Feeney)	5
HQDA (ATTN: DAMI-PBP, MAJ Bruns)	5
HQDA (ATTN: DACA-MSP, Ms. Brown)	2
HQDA (ATTN: DASG-HCD-O, Ms. Brenneman)	2
HQDA (ATTN: DACH-PPI, Ms. I. Butcher)	2
HQDA (ATTN: DAJA-AL, MAJ T. Keller)	2
HQDA (ATTN: DAAR-PLO, MAJ Anstrom)	2
HQDA (ATTN: DAAG-ZDP, Mr. T. Austin)	2
HQDA (ATTN: DAEN-ZCM, Mr. G. Chaklos)	2
HQDA (ATTN: DACS-DPD, Ms. R. Gerstein)	2
HQDA (ATTN: DACS-DMO, Ms. Brown)	50
OFFICE, CHIEF OF STAFF, ARMY (ATTN: MAIL AND RECORDS)	5
NGB (ATTN: NGB-ARC-P, Mr. F. San Pietro)	2
Army Library	2
COMMANDER-IN-CHIEF, US ARMY EUROPE AND SEVENTH ARMY (ATTN: AEAGX-OR)	5
COMMANDER:	
US ARMY TRAINING AND DOCTRINE COMMAND (ATTN: ATCD-AU, Mr. K. Boyd)	20
US ARMY FORCES COMMAND (ATTN: AFCU-MD, Mr. W. Bharmal)	20
US ARMY MATERIEL DEVELOPMENT AND READINESS COMMAND (ATTN: DRCMD-S, Dr. J. Lazaruk)	20
US ARMY COMMUNICATIONS COMMAND (ATTN: CC-OC-MS, Mrs. L. Guy)	10
US ARMY MILITARY TRAFFIC MANAGEMENT COMMAND (ATTN: MT-PL, MAJ A. Revie)	2
US ARMY CRIMINAL INVESTIGATION COMMAND (ATTN: CIAC-MS, Mr. G. Damon)	2
US ARMY MILITARY DISTRICT OF WASHINGTON (ATTN: ANRM-RE, Ms. I. Murray)	2
US ARMY HEALTH SERVICES COMMAND (ATTN: HSCM-R, LTC Cecere)	5
US ARMY INTELLIGENCE AND SECURITY COMMAND (ATTN: IAMA, Mr. Martin, II.)	2
US ARMY MILITARY ENTRANCE PROCESSING COMMAND (ATTN: MEPCT-P, Dr. B. Crain)	2

DACS-DMO
SUBJECT: Army Study Highlights

24 September 1986

DISTRIBUTION:

COPIES

US ARMY RECRUITING COMMAND (ATTN: USARCPAC-RE, Mr. J. Toomepuu)	2
US ARMY OPERATIONAL TEST AND EVALUATION AGENCY (ATTN: CSTE-ZS, COL R. Pell)	2
US ARMY BMD SYSTEMS COMMAND (ATTN: BMDSC-PS, Ms. R. Seals)	2
US ARMY JAPAN	2
US ARMY INFORMATION SYSTEMS COMMAND (ATTN: AS-OC-SAS)	2
ANNISTON ARMY DEPOT (ATTN: SDDAN-DRM-REM)	2
NAVAL RESEARCH DEVELOPMENT CENTER	2
EIGHTH US ARMY	2
US ARMY LOGISTICS MANAGEMENT CENTER (ATTN: MAIL AND RECORDS)	1
(ATTN: DLSIE)	4
SUPERINTENDENT, UNITED STATES MILITARY ACADEMY (ATTN: MACO-M, Ms. B. Arnott)	2
SUPERINTENDENT, UNITED STATES MILITARY ACADEMY (ATTN: MADN-F, MAJ Parlier)	2
CHIEF OF ENGINEERS (ATTN: ESC, Mr. L. Surprise)	2
DIRECTOR:	
US ARMY CONCEPTS ANALYSIS AGENCY (ATTN: CSCA-MSM-O, (MAJ SATTERWHITE), CSCA-RQ, CSCA-RA, CSCS-FS)	10
ARROYO CENTER (ATTN: Mr. S. Drezner)	5
STRATEGIC STUDIES INSTITUTE (ATTN: AWC, Dr. A. Sabrosky)	2
DEFENSE NUCLEAR AGENCY (ATTN: LASS)	2
DEFENSE LOGISTICS STUDIES INFORMATION EXCHANGE	2
COMMANDANT:	
US ARMY WAR COLLEGE (ATTN: LIBRARY)	5
NATIONAL DEFENSE UNIVERSITY (ATTN: LIBRARY)	10
US ARMY COMMAND AND GENERAL STAFF COLLEGE (ATTN: LIBRARY)	5
ARMED FORCES STAFF COLLEGE (ATTN: LIBRARY)	5
US NAVY WAR COLLEGE (ATTN: LIBRARY)	5
US AIR WAR COLLEGE (ATTN: LIBRARY)	5
CHIEF OF NAVAL OPERATIONS (ATTN: OP966)	5
HEADQUARTERS, US AIR FORCE (ATTN: AF/SA1)	1
(ATTN: AF/SAM1)	1
HEADQUARTERS, US MARINE CORPS (ATTN: RDS-40)	5
OFFICE, JOINT CHIEFS OF STAFF (ATTN: SAGA)	2
DEFENSE TECHNICAL INFORMATION CENTER (ATTN: DTIC-DDA)	2



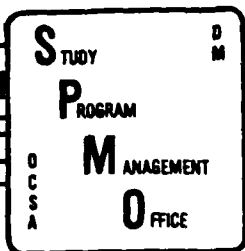



TABLE OF CONTENTS

STUDY GISTS

A. Armored Gun System Cost Analysis,	1
B. Chemical Assessment Methodology and Data (CAMAD) Study,	5
C. Engineer Analysis of the 9th Infantry Division (Motorized) (9ID(MTZ))	7
D. Engineer Assessment, Korea Forward Combat Zone Analysis, Volume 1	9
E. Retail Supply Performance Measures (RSPM)	11
F. TACFIRE Post-Fielding Training Effectiveness Analysis	13
G. USAREUR DCSSENGR Organization Study	15
H. USAREUR Support Structure Study	17

	<p>TRASANA-COEA-20-85</p> <p><u>ARMORED GUN SYSTEM</u></p> <p>COST ANALYSIS</p>	<p>STUDY GIST</p>
---	---	------------------------------

1. The Principal Results

a. The two 800-vehicle systems included in the life cycle cost analysis are the AGS chassis with 105mm turret and austere fire control and the AGS chassis with 105mm turret and improved ("state-of-the-art") fire control.

b. Life cycle cost estimates in constant FY86 M\$ for the two alternatives are given below.

	AGS-105mm <u>Austere</u>	AGS-105mm <u>Fullup</u>	Cost <u>Difference</u>
Development	\$ 199.0	\$ 260.9	\$ 61.9
Production	949.7	1,630.2	680.5
Military Construction	0	0	0
Fielding	55.7	97.4	41.7
Sustainment	3,062.0	3,728.0	666.0
Total	\$4,266.4	\$5,716.5	\$1,450.1

c. The AGS-105mm Austere was less costly in every major cost category than the AGS-105mm Fullup. The total life cycle cost difference is \$1.5B. The primary cost differences in the vehicle were in manufacturing cost (\$570.0M), replenishment spares (\$600.8M), and depot maintenance (\$223.6). The fullup vehicle with autoloader cost less in personnel costs due to a reduction of one crew member per vehicle.

d. Five vehicle system alternatives were included in the force cost analysis. They are the AGS-105mm Austere, the AGS-105mm Fullup, the AGS-120mm Austere, an MLRS chassis with a 25mm BRADLEY turret, upgraded austere fire control, and hypervelocity missile (HVM) capability, and an MLRS chassis with a 105mm turret, upgraded austere fire control, and advanced antitank weapon system-heavy (AAWS-H) capability.

e. Force cost estimates in constant FY86 M\$ for an AGS battalion are given below.

<u>Vehicle</u>	<u>Nonrecurring Cost</u>	<u>20-Year Recurring Cost</u>	<u>Force Cost</u>	<u>Normal</u>
AGS-105mm Austere	\$ 90.3	\$560.2	\$650.5	1.000
AGS-105mm Fullup	155.1	597.1	752.2	1.156
AGS-120mm Austere	109.0	800.8	909.8	1.399
MLRS-25mm-HVM	177.1	601.9	779.0	1.198
MLRS-105mm-AAWS-H	182.9	615.4	798.3	1.227

f. The AGS-105mm Austere was the least costly alternative force by more than \$100M over twenty years. The main cost difference between force alternatives were: battalion vehicle costs and per-vehicle ammunition and missile costs.

2. The Main Assumptions

- a. AGS vehicle system life is assumed to be twenty years.
- b. There is no fielded base case weapon system.
- c. The size of the required AGS fleet has not been finalized.
- d. Logistic ramifications through battalion level have been considered.
- e. Each vehicle had an Armor School approved basic load whose cost was included in the force cost analysis.
- f. The cost of the annual service practice was included in the recurring vehicle cost.
- g. The force cost analysis assumed an in-place force.

3. The Major Restrictions: None

4. The Scope of the Study: The study was limited to a life cycle cost analysis of two 105mm weapon systems and a force cost analysis of five vehicle systems.

5. The Study Objective. To conduct a life cycle cost analysis and a force cost analysis for inclusion in a cost and operational effectiveness analysis prepared by the US Army Armor School.

6. The Basic Approach. The level II validated life cycle cost estimates from the Army materiel Command were analyzed for consistency in methodology and accurate calculation. The force configurations for the five force alternatives were derived from data received from the Armor School and modified using approved cost-estimating relationships.

7. The Reason for Performing the Study. Combat Developments Study Directive dated 4 May 84 required a life cycle and force cost analysis for a milestone decision on an armored gun system.

8. Impact Statement. The cost estimates of this study are not intended to provide a budgetary estimate of system costs and should not be used in that manner. They do provide an accurate relative ranking of alternatives based on cost and a reasonable and consistent estimate of expected cost differences.

9. The Study Sponsor. HQ TRADOC, ATCD-ML, Ft Monroe, VA 23651-5000.
10. The Study Proponent. US Army Armor School, ATSB-CD-SD, Ft Knox, KY 40121.
11. The Analysis Agency. US Army TRADOC Systems Analysis Activity, ATOR-TDA, White Sands Missile Range, NM 88002-5502.
12. DTIC Accession Number. DA 304063.
13. Questions and Comments. The US Army TRADOC Systems Analysis Activity, ATOR-TDA, White Sands Missile Range, NM 88002-5502. POC: Ms. Myrna K. Kroh, AUTOVON 258-4617.
14. Study Start and Completion Date. May 1984 - Aug 1985.



CHEMICAL ASSESSMENT METHODOLOGY AND DATA (CAMAD) STUDY

STUDY
SUMMARY
CAA-TP-86-1

THE PRINCIPAL FINDINGS of this study are:

(1) The US Army Concepts Analysis Agency (CAA) currently has only a very limited chemical warfare analysis capability. CAA does, however, have the motivation to implement a comprehensive analysis program and has a wide variety of related conventional models and adequate resources to adapt these models to support integrated warfare studies.

(2) CAA should orient its CW model development program toward the analysis of ten fundamental issues. These range from national level issues to those which are primarily of concern to the US Army Chemical Corps. The issues are: the Army in a CW Environment, the Conventional/CW Trade-off, Threat CW Employment Options, CW Munitions Requirements, CW Munitions Distribution, CW Munition Logistics, CW Equipment Consumption Rates, Value of CW Defense Equipment, Optimum Mix of CW Munitions and Defense Equipment, and CW Force Structure Requirements.

(3) Model development or other action is required on eight models. The primary and most important of these is the Force Evaluation Model (FORCEM) and its player interactive version, FORCEM Gaming Evaluator (FORGE). The other models are: Force Analysis Simulation of Theater Administrative and Logistic Support (FASTALS), Wartime Fuel Factors Model (WAFF), Force Design Model (FDM), Analysis of Force Potential Model (AFP), Chemical Casualty Assessment Model (CHEMCAS), Vector-in-Commander Model (VIC), and Resource Constrained Procurement of Munitions Model (RECPOM).

(4) Collection of data for operation of these models will remain a continuing problem. The low-resolution models require a high degree of data aggregation.

THE MAIN ASSUMPTIONS upon which this study is based are:

(1) Chemical warfare should be addressed in many CAA products, but this is not always articulated by the study sponsor.

(2) CAA should conduct chemical warfare studies.

(3) Appropriate models will be required to perform studies. These may include models other than theater-level combat simulations.

PRINCIPAL LIMITATIONS OF THE STUDY. None

THE SCOPE OF THE STUDY includes a review of CAA's CW program and the development of a plan for continued integration of chemical warfare considerations into CAA's studies and their underlying methodologies.

Fundamentally each CAA directorate is responsible for including chemical warfare in its studies. The Agency, however, should have an overall plan to avoid duplications among directorates and ensure that all facets of the CW problem are addressed. This should include the use of similar methodologies and a compatible set of chemical weapons effects data.

THE STUDY OBJECTIVES were to:

- (1) Identify CAA's study requirements.
- (2) Determine the methodologies to be used to perform the CW studies and how CAA should develop the methodologies.
- (3) Determine what chemical agent effects data are required to support implementation of the methodologies.

THE BASIC APPROACH followed in doing this study was to discuss the chemical warfare problem with a wide variety of potential study sponsors, conventional war modelers, both internal and external to CAA, and then to examine in detail the changes that would have to be made to CAA models and to data collection requirements.

THE REASON FOR PERFORMING THE STUDY is to establish an Agency-wide unified approach to the chemical warfare (CW) modeling effort.

THE STUDY IMPACT is to provide a coherent, phased direction for the chemical analysis and other CW activities of CAA for several years.

THE STUDY SPONSOR is the Director, US Army Concepts Analysis Agency.

THE PERFORMING ORGANIZATION AND PRINCIPAL AUTHORS are the Nuclear and Chemical Division, Requirements and Resources Directorate, Concepts Analysis Agency with principal contributors MAJ(P) Gordon R. Miller, MAJ Gary W. Baumert, MAJ Teresa J. Holley and Dr. Robert L. Helmbold.

DTIC ACCESSION NUMBER is ADF 860078

COMMENTS AND QUESTIONS may be sent to the Director, US Army Concepts Analysis Agency, ATTN: CSCA-RQN, 8120 Woodmont Avenue, Bethesda, Maryland 20814-2797. The Agency point of contact is MAJ(P) Gordon R. Miller, Phone AV 295-5267.

THE START AND COMPLETION DATES are 31 July 1985 and 30 April 1986, respectively.



ENGINEER ANALYSIS OF THE 9TH INFANTRY DIVISION (MOTORIZED) (9ID(MTZ))

STUDY
GIST

THE PRINCIPAL FINDINGS:

(1) The division must have the capability equivalent of two engineer battalions to meet all of its Vital engineering requirements. To meet lower priority requirements, even more battalion capability is required.

(2) The mix of equipment in the current divisional battalion must be changed to better conform to task requirements.

(3) Corps engineer units which support the division must be positioned forward in the maneuver brigade areas, and focused on anti-tank ditching and survivability missions.

(4) To gain a mobility advantage over threat forces, the division must use its aviation, artillery, and engineer scatterable mine assets.

THE MAIN ASSUMPTIONS:

(1) The division's design TOE is fixed as of November 1984.

(2) The 1988 DIME scenarios accurately reflect the division's published operational concepts, and adequately define the number and type echelon-above-division (EAD) units which support the division and work within its area of operation (AO).

THE PRINCIPAL LIMITATIONS: No personnel could be added to the engineer force structure, and recommended equipment changes are attainable without increases in deployment transportation assets.

THE SCOPE OF STUDY: This study:

(1) Analyzed the division's engineer capabilities under Southwest Asian and European wartime scenarios.

(2) Ranked all engineer tasks and calculated task requirements.

(3) Determined Class IV and V needed to support mobility and countermobility operations.

(4) Identified the EAD engineer units needed to augment the division.

(5) Recommended changes to the EAD and division organizations which will improve engineer capability.

THE STUDY OBJECTIVE: This study determined realistic requirements, in priority order, and compared them with capabilities for different scenario battle phases and time periods to determine actual user needs.

THE BASIC APPROACH:

(1) Each scenario was divided into phases covering: deployment and lodgement, covering force area operations, and separate offensive and defensive actions.

(2) For each battle phase, requirements and capability were tracked for committed brigades plus the division rear area.

(3) A base case (division only) and augmentation case (division plus EAD) were considered for each scenario.

(4) Engineer capability was computed down to company-sized units in squad-hours and five classes of dominant equipment-hours.

(5) A data base was developed from which the engineer requirements for the engineer emplacement of direct-fire weapons under different scenarios can be determined. This will allow the user to modify study findings if doctrine changes.

(6) Because of the division's unique operational concept and employment potential, all recommendations for unit redesign weighted the results of the Southwest Asian scenario 2-to-1 over those of the European scenario.

REASONS FOR PERFORMING THE STUDY: The sponsor requested this study because of the new and evolving concept for the 9ID(MTZ). The organic divisional engineer battalion had been significantly reduced in size and several traditional support capabilities had been eliminated. A detailed analysis of wartime engineer requirements was needed to validate unit design equipment needs and identify EAD engineer augmentation requirements.

STUDY SPONSOR: Commander, Army Development and Employment Agency (ADEA), Fort Lewis, WA 98433-5000.

IMPACT OF STUDY: The study's 12 conclusions and recommendations were accepted by both ADEA and the 9ID(MTZ) and the study results are now being used as a basis for engineer structure changes, mission planning, and force structuring of engineer augmentation packages for war contingency areas. The sponsor was pleased with the comprehensive analysis, and has requested a similar study of the Light Infantry Division, which is now in progress.

PERFORMING ORGANIZATION AND PRINCIPAL AUTHORS: The performing organization was the US Army Engineer Studies Center. The principal authors were Mr. Douglas K. Lehmann, Project Manager; MAJ James A. Milobowski, Senior Analyst; Mr. Robert B. Grundborg, Analyst; and Mrs. Jean A. Lamrouex, Associate Analyst.

DTIC ACCESSION NUMBER of the final report is A162941.

COMMENTS AND QUESTIONS MAY BE SENT TO: US Army Engineer Studies Center, Casey Building #2594, Fort Belvoir, VA 22060-5583; POC: Mr. Bruce W. Springfield, AUTOVON 345-2280.

DATES OF STUDY: Start -- 1 July 84; Final SAG and draft report -- 30 July 85; Final publication -- December 85 (3.2 analytical man-years expended).



ENGINEER ASSESSMENT, KOREA FORWARD COMBAT ZONE ANALYSIS Volume I

STUDY
GIST

THE PRINCIPAL FINDINGS:

(1) The Combined Forces Command (CFC) engineer force is not organized to support the most important engineer requirements. Too many engineers are in areas where engineer requirements will be relatively low; too few engineers are assigned where the most important requirements will occur.

(2) CFC is critically short of the engineer equipment required to support the substantial mobility workload of the AirLand Battle.

(3) Republic of Korea (ROK) civilian engineers can supplement military engineering capabilities and significantly reduce the CFC engineer shortfall.

(4) Implementation of several practical recommendations made in the study will significantly improve the CFC engineer support posture.

THE MAIN ASSUMPTIONS:

(1) Enemy forces will be deployed and equipped according to current intelligence estimates.

(2) The CFC engineer force will be organized, structured, and deployed as reflected in the current Time-Phased Force Deployment List (TPFDL) and CFC operational plans.

(3) CFC units will be at current (1985) levels of organization and strength.

(4) ROK civilian engineer support agreements will be executed as called for in the current CFC operational plans.

THE PRINCIPAL LIMITATIONS: The study advisory group developed a prioritized list of combat engineer support tasks in CFC. Engineer requirements for several hypothesized combat scenarios were arrayed in this priority order against engineer capabilities during discrete time periods corresponding to the time phases of the CFC operational plans. A perfect allocation of engineer resources is assumed during each time period in that engineer requirements during each period are accomplished in priority sequence. Thus, if a shortfall of engineers is projected, all of the tasks below a certain point of the priority list will not be accomplished. In reality, engineers cannot be perfectly allocated to the most important tasks. However, this methodology does allow the decision maker to estimate the broad implications of engineer nonsupport.

THE SCOPE OF THE STUDY: This study:

(1) Developed engineer support requirements in the CFC Forward Combat Zone (FCZ), as defined by the CFC operational plans and extended by the study's combat scenarios, for both US and ROK forces.

(2) Developed ROK and US engineer support capabilities based on the current organization and strength of the engineer units in CFC, the ROK engineer units scheduled to mobilize in Korea, and the US engineer units scheduled to arrive in Korea, according to current CFC operational plans.

(3) Compared CFC engineer support requirements and capabilities to determine shortfalls and imbalances in engineer support.

(4) Developed specific management initiatives that the CFC should undertake to help offset current shortfalls and imbalances.

THE STUDY OBJECTIVES: The principal objectives of this study were to: assess the engineer requirements of CFC across its entire range of combat and combat support activities within the FCZ for both ROK and US forces; quantify engineer requirements by phase and stage of the CFC operational plan and by CFC major subordinate command; establish the recommended priority of engineer support requirements; quantify the US and ROK military engineer ability to accomplish FCZ engineer requirements; assess the effect of any engineer shortfalls on CFC's ability to sustain combat operations; and identify actions and programs needed to eliminate the shortfalls.

BASIC APPROACH:

(1) This study provided an analysis of CFC combat engineer requirements during wartime, examined capability, and quantified shortfalls. Current organization, strength, and equipment were used as the basis for both requirements and capabilities.

(2) Realistic limits were placed on the amount of engineer work that should be attempted to optimally support CFC. Requirements were based on wartime engineer tasks in CFC, organized into a prioritized sequence. The degree of urgency was established by the study advisory group. This determined the priority of assigning engineer assets to requirements when the comparison of requirements and capability was made. All estimates were made in terms of squad-hours, key equipment-hours, and important types of engineer materiel. Engineer requirements were estimated separately for each CFC corps and each field army rear area. Requirements were aggregated for comparison to capability to give an overall CFC-level assessment of the engineer support posture.

REASONS FOR PERFORMING THE STUDY: LTG John L. Pickitt, Chief of Staff, CFC requested (in a 4 June 1984 letter to the Commanding General, US Army Corps of Engineers) that ESC undertake a comprehensive assessment of the engineer support posture relative to support of CFC OPLAN 5027; no comparable study existed.

STUDY IMPACT: The study provides a detailed assessment of the current engineer support posture in CFC and serves as a source document for improving wartime CFC engineer support in the future. Impact is immediate and will have long term utility in enhancing the national security interests of both the Republic of Korea and the United States.

STUDY SPONSOR: Assistant Chief of Staff, Engineer, ROK/US Combined Forces Command, Seoul, Korea.

PERFORMING ORGANIZATION AND PRINCIPAL AUTHOR: The performing organization was the US Army Engineer Studies Center (ESC). The principal author was CPT John R. Livingston.

AGENCY ACCESSION NUMBER of the final report is DA305198.

COMMENTS AND QUESTIONS MAY BE SENT TO: (1) US Army Engineer Studies Center, Casey Building #2594, Fort Belvoir, VA 22060-5583; (2) POC: CPT John R. Livingston; (3) AUTOVON 345-2278.

START AND COMPLETION DATE OF THE STUDY: ESC was tasked with the study by the Deputy Commander, US Army Corps of Engineers in July, 1984. The assessment was completed in July, 1986.



RETAIL SUPPLY PERFORMANCE MEASURES (RSPM)

STUDY
SUMMARY
CAA-SR-85-24

THE REASON FOR PERFORMING THIS STUDY was to examine retail supply performance measures contained in Army Regulation 710-2 (Supply Policy Below the Wholesale Level), as they apply to direct support units (DSU), to determine their usefulness and effectiveness as management tools. Significant changes in supply policy and the supply operating environment have occurred since performance measures and objectives were first formulated in 1972. It was believed that many of them may no longer be appropriate.

THE PRINCIPAL FINDINGS of the work reported in this study are:

(1) The 14 performance measures presently in AR 710-2 for the most part are not useful or effective measures by which DSU managers can fulfill Army DSU supply system objectives. An alternative set of 10 measures with revised objectives is proposed. Some of these measures require adjustments to policy, as described in the text.

Priority	Measure	Objective	Management level
1	Demand satisfaction	85%	75-95%
2	Zero balances with dues out	6%	0-10%
3	Materiel release denial rate	0%	0-3%
4	Inventory accuracy	95%	85-100%
5	Receipt processing time: ^a		
	Divisional DSUs	5 days	6 days
	Nondivisional DSUs	4 days	5 days
6	Request processing time: ^a		
	Divisional DSUs	4 days	5 days
	Nondivisional DSUs	3 days	4 days
7	Combat authorized stockage list (ASL) mobility index:		
	Forward DSU elements	100%	90%
	Rear (main) elements	TBD	TBD
8	ASL turbulence	3%	15%
9	Nonstockage list (NSL) excess index ^a	0%	15%
10	DS4 daily cycle rate ^a	18 per month	16 per month

^aMeasures not presently in AR 710-2.

(2) DSUs in the field are not generally meeting most of the present performance objectives primarily due to constraints imposed by supply policies.

(3) Stockage breadth policies, which determine the number of lines which may be stocked, and stockage depth policies, which determine how many of each line may be kept in inventory, have contributed to suboptimal supply

performance in the areas of demand accommodation, ASL turbulence, demand satisfaction and zero balance. Specific adjustments to policy which will improve readiness and sustainability are proposed.

THE MAIN ASSUMPTIONS were that the distribution of supply demands in DSUs today is sufficiently similar to those of past analytical efforts to make inferences drawn from those works still valid, and that the set of supply system management objectives formulated as the baseline for analysis are congruent with otherwise unstated DA policy.

THE PRINCIPAL LIMITATION of this study is that due to the lack of an operational DSU supply simulator, some of the numerical analyses of the effects of recommended policy changes on present DSUs were based on past studies of DSU performance. No new modeling was conducted.

THE SCOPE OF THE STUDY was to examine DSU supply performance in light of policies in effect or under active consideration as of 1 December 1984. Only peacetime supply operations in the current timeframe were examined.

THE STUDY OBJECTIVES were:

- (1) To evaluate the usefulness and effectiveness of supply performance measures contained in AR 710-2, as they apply to DSUs, in light of current supply policies.
- (2) To determine for those measures found to be useful and effective, the appropriate performance objectives and management levels.
- (3) To identify appropriate potential additions, deletions, or modifications to the supply performance measures of AR 710-2.

THE BASIC APPROACH was to conduct an empirical analysis of research previously conducted by others, to conduct a numerical analysis of present performance data of active divisions and nondivisional DSUs based on a data collection survey, and to evaluate responses to a DSU questionnaire to assess how performance measures are presently used by supply managers in the field.

THE STUDY IMPACT. The study provides a rational basis for selection of supply performance measures and identifies policies leading to suboptimal performance.

THE STUDY SPONSOR was the Deputy Chief of Staff for Logistics, Headquarters, Department of the Army.

THE STUDY EFFORT was directed by LTC James D. Chipps, Force Systems Directorate, US Army Concepts Analysis Agency. The study was conducted February-December 1985.

DTIC ACCESSION NUMBER of the final report is ADF 860061.

COMMENTS AND QUESTIONS may be addressed to the Director, US Army Concepts Analysis Agency, ATTN: CSCA-FSL, 8120 Woodmont Avenue, Bethesda, MD, 20814-2797. POC: LTC Chipps, AV 295-5301.



TRASANA TEA-16-85
TACFIRE POST-FIELDING
TRAINING EFFECTIVENESS ANALYSIS

**STUDY
GIST**

1. The Principal Results.

a. The TACFIRE Fire Support Course (F6), the TACFIRE Support Element/Liaison (FSE) Course, the TACFIRE Tactical Operations Center Course (TTOC), and the Field Artillery (FA) Computer Repairer Course are effective training programs.

b. Soldiers who are school trained and receive frequent unit training (either in garrison or during field exercises) are proficient at operating the TACFIRE computer.

c. Soldiers who operate the variable format message entry device (VMED) were not proficient. These soldiers need additional unit training in the manual operations that the computer is designed to augment.

d. Corps/Brigade/Division Artillery (DIVARTY) personnel need additional training on inputting a subscriber table. VMED operators need additional training on counterfire tasks and fallout prediction and vulnerability analysis.

e. The direct support (DS) repairers do not receive unit training and most were not proficient in troubleshooting the TACFIRE system.

f. AFATDS software should be designed to be more user-friendly than the TACFIRE software.

g. Communications, PMCS, and troubleshooting should be emphasized throughout the AFATDS instruction.

2. The Main Assumptions. None

3. The Major Restrictions. The effort was restricted by the small sample size of MOS 34Y soldiers tested in Germany and the nonavailability of an approved AFATDS critical task list.

4. The Scope of the Study. Included evaluating the institutional and the CONUS/OCONUS unit training of personnel who operate or repair the TACFIRE computer and VMED.

5. The Study Objectives.

a. To determine the effectiveness of TACFIRE institutional training.

b. To determine the effectiveness of TACFIRE unit (sustainment) training.

c. To identify any training issues in TACFIRE relevant to the AFATDS.

6. The Basic Approach. The basic approach was to survey/test TACFIRE operators and repairers at the completion of TACFIRE courses and in the CONUS and OCONUS units who operate or repair the Corps, Brigade, DIVARTY, or Battalion TACFIRE computer and the VFMED. Three written tests and four hands-on tests were administered to determine soldier background, task training, and perceptions of training. Battalion commanders/S3s were interviewed.
7. The Reason for Performing the Study. The purpose was to determine the effectiveness of the tactical fire direction system (TACFIRE) training and identify training issues associated with the follow-on advanced field artillery tactical data system (AFATDS). Since TACFIRE is the command and control center of field artillery, it is imperative to determine whether the Army trains its operators and repairers effectively. Also, many soldiers who operate or maintain TACFIRE (MOS 13E, 13F, 17C, and 34Y) are not tested on TACFIRE tasks on their skill qualification test.
8. Impact Statement. Although TACFIRE is complex and requires extensive training, and is subject to skill decay, adequate proficiency can be sustained with 6 to 8 hours of appropriate unit training per week. Additionally, a procedural checklist for troubleshooting the TACFIRE system should be developed.
9. The Study Sponsor. HQ TRADOC, ATTG-PA, Ft Monroe, VA 23651-5000.
10. The Study Proponent. US Army Field Artillery School, ATSF-OA, Ft Sill, OK 73503-5600.
11. The Analysis Agency. US Army TRADOC Systems Analysis activity, ATOR-THB, White Sands Missile range, New Mexico 88002-5502.
12. DTIC Accession Numbers. ADB092970 and ADB098819.
13. Questions and Comments. US Army TRADOC Systems Analysis Activity, ATOR-THB, White Sands Missile Range, New Mexico 88002-5502. POC: Mrs. Lounell Southard or Dr. Edward George, AUTOVON 258-2043.
14. Study Start and Completion Date. April 1984 to August 1985.



USAREUR DCSENGR ORGANIZATION STUDY

STUDY
GIST

THE PRINCIPAL FINDINGS:

(1) Unprecedented construction, renovation, and operations and maintenance workload increases coupled with manpower reductions are straining USAREUR engineer resources. To accomplish this increased workload before Congressional funding slacks off, the DCSENGR headquarters staff spends most of its time reacting to operational matters instead of performing the traditional headquarters functions of planning and establishing policy.

(2) Increased Host Nation environmental awareness coupled with additional USAREUR activity has complicated engineer mission accomplishment. This in turn has created delays and, in many cases, work stoppages or cancellations of already approved and funded projects.

(3) Individual functional plans of DCSENGR elements need to be integrated into an overall perspective to enable key decision makers to determine the appropriate distribution of limited USAREUR resources.

(4) Appropriate missions and functions of the DCSENGR, the Installation Support Activity, Europe (ISAE), and the USAREUR Major Command (UMC) and Military Community (MILCOM) Directors of Engineering and Housing must be clarified to prevent excessive duplication of efforts.

THE MAIN ASSUMPTIONS:

(1) The "Commander's Army" concept remains; i.e., USAREUR UMC and MILCOM engineer elements will not become part of a stovepipe organization.

(2) ISAE and the Real Estate Activity, Europe (REAE) remain as separate Field Operating Activities with their own Tables of Distribution and Allowances. This precludes consolidating DCSENGR field and headquarters functions in the same organizational element.

(3) The recommended organization must function in peacetime, transition-to-war, and wartime environments.

PRINCIPAL LIMITATIONS: The CINCUSAREUR recently directed an organizational review of his entire headquarters staff. The ESC study was used as a major engineer input to this effort. However, the objectives, assumptions, and limitations of the CINCUSAREUR study differed from those used by ESC; therefore, the CINCUSAREUR study produced some conclusions and recommendations which were incompatible with the results of ESC's study.

STUDY SCOPE:

(1) Examine the internal and external working environments of the DCSENGR organizations and their interface with Department of the Army and USAREUR Headquarters and USAREUR field elements. (DCSENGR consists of approximately 500 personnel.)

(2) Identify current and anticipated problems.

(3) Develop and evaluate alternative organizational structures and/or procedures for resolving or mitigating identified problems and improving current operations.

(4) Examine other major Army command (MACOM) engineer elements to determine if alternative procedures or structural alignments can improve the USAREUR DCSENGR organization.

STUDY OBJECTIVES:

(1) Assess the effectiveness of, and develop procedural and structural recommendations for improving the USAREUR DCSENGR organizations in planning workload, programming resources, and directing US engineer resources in providing support to

USAREUR forces during peace and war.

- (2) Make improvements while achieving a 5-percent reduction in manpower.

BASIC APPROACH: Working with the Study Advisory Group (SAG), ESC identified major organizational goals, determined analysis constraints and assumptions, and established criteria for evaluating organizational proposals. Initial research data were gathered through literature searches, questionnaires, a review of past DCSENGR realignment efforts and pertinent regulations, and by examining other MACOM engineer organizations. In addition, extensive on-site interviews and workshop sessions were held with the representatives of the USAREUR DCSENGR, the US Army Corps of Engineers (USACE) Headquarters, and USAREUR Headquarters, the UMC and MILCOM DEH staffs, and the SAG. From these data ESC developed a wide range of organizational and procedural alternatives designed to address problem areas and improve engineer operations in general. Alternatives were narrowed to two primary candidates during a mid-term inprocess review with the sponsor and SAG. ESC then conducted an in-depth analysis of the remaining organizational approaches, and based on how well they met DCSENGR goals and resolved identified key issues and problems, made recommendations.

REASON FOR PERFORMING STUDY: MG Scott B. Smith, USAREUR DCSENGR, requested the Commander, USACE, to task ESC with an independent, objective organizational assessment of the DCSENGR organizations. No comparable study existed.

IMPACT OF STUDY:

- (1) Encouraged DCSENGR Senior Managers to focus on corporate rather than functional area goals and problem areas. This process indirectly improved internal communication and formed the basis for improvements.

- (2) Established direct organizational and procedural links between establishing goals and planning and developing policy for the field.

- (3) Established an organizational approach to integrating construction and renovation planning and programming with operations and maintenance requirements. Related both of these requirements with associated engineer resource and Host Nation planning requirements. This concept is currently being examined in the Department of Army, Assistant Chief of Engineers Office for potential use in other MACOM engineer organizations.

- (4) Provided the DCSENGR and his senior managers with a range of options that could be implemented separately or sequentially -- it is an on-the-shelf blueprint for organizational change for many years to come.

- (5) Provided major input on engineer operations to the CINCUSAREUR staff study. ESC has been asked to re-examine the DCSENGR organization in light of that study and provide recommendations utilizing the strong points of both analyses.

SPONSOR: The sponsor was the USAREUR DCSENGR.

PERFORMING ORGANIZATION AND PRINCIPAL AUTHORS: The performing organization was the US Army Engineer Studies Center (ESC). The principal authors were Mr. Donald W. Spigelmyer, Dr. Lawrence A. Lang, Mr. John Sustar, Mr. Pleasant Mann, and Mr. Otha W. Evans.

DTIC ACCESSION NUMBER: DA 306757.

COMMENTS AND QUESTIONS MAY BE SENT TO: US Army Engineer Studies Center, Casey Building #2594, Fort Belvoir, VA 22060-5583; POC: Dr. Lawrence A. Lang; AUTOVON: 345-2283

START AND COMPLETION DATE: March 1985 through June 1986.



USAREUR
SUPPORT STRUCTURE STUDY

STUDY
GIST

THE PRINCIPAL FINDINGS:

- (1) Reduce mechanics and repair parts density at organizational level; use master diagnosticians forward; improve light weight test equipment for forward use.
- (2) Increase number of mobile maintenance teams in FSB; provide more assemblies and line replacement units (LRU) to support replacement forward; conduct scheduled services and on-condition maintenance from a consolidated facility.
- (3) Centralize planning and control of all elements of distribution -- combine resources of the Theater Army Movement Control Agency (TAMCA) and the Theater Army Materiel Management Center (TAMMC) -- mirror this at subordinate levels; develop integrated simulation model of the distribution system.
- (4) Capitalize on automation to expedite information and supply flow; improve asset visibility in theater; control retrograde of reparable.
- (5) Establish a dedicated premium transportation service for movement of critical items.
- (6) Use programmed supply where demand is predictable.
- (7) Structure the support force according to workload rather than existence rules.

THE MAIN ASSUMPTIONS:

- (1) Organize for war, then modify where possible for efficiency in peacetime.
- (2) The study should not presume opportunity for significant restationing as envisioned in the USAREUR Master Restationing Plan.
- (3) No increase in active component or civilian end strength and no further significant military to civilian substitution. Current European troop ceiling will remain in effect.
- (4) Current command relationships remain intact (EUCOM, SETAF).
- (5) Requirements will be based on NATO scenario only.

THE PRINCIPAL LIMITATIONS: Because of constraints on time and manpower, testing of the concepts and detailed findings had to be tasked to other commands and agencies.

THE SCOPE OF STUDY: The study was to take into account the fact that the European theater is a mature theater with facilities available for maintenance operations, an excellent transportation network, established communications, and a potential contract/host nation support work force capable of supplementing US Forces. The study was also to look for innovative ways of improving capability by capitalizing on technology.

THE STUDY OBJECTIVES: The study objective was to identify, evaluate and recommend near-term (5 year) and far-term (15 year) methods of realigning support structure in Europe to enhance combat capability while minimizing the requirement for support spaces--to improve overall effectiveness.

THE BASIC APPROACH:

(1) A train-up period was conducted for study group members that included briefings on USAREUR, Functional Area Assessments, System Program Reviews, and a review of previous studies and related actions. Interviews were conducted with selected senior officers and visits were made to many military and civilian organizations to gain perspective and information. A Study Advisory Group provided guidance and reviewed the progress of the study group. Key steps followed during the study are listed below.

- (2) Do more with productivity enhancing capital investment equipment.
- (3) Make better use of theater air.
- (4) Distinguish between mature and expeditionary theater.
- (5) Look at moving maintenance and supply to rear - push package to brigade - better use of air.
- (6) Eliminate redundant organizations.
- (7) Look at support requirements, not Time Phased Force Deployment List (TPFDL).
- (8) Consider support at every other level.
- (9) Examine "Federal Express" concept.
- (10) Incorporate all Log RESHAPE initiatives.
- (11) Use automation and communications to increase productivity.
- (12) Consider future productivity actions - add bill, subtract billpayer.
- (13) Consider combat support area for similar efficiencies.

REASONS FOR PERFORMING THE STUDY: Discussion during the March 1985 Army commanders' Conference resulted in the requirement to determine whether the Army had the proper balance of support units for USAREUR.

SPONSOR: The Deputy Chief of Staff for Logistics, United States Army.

IMPACT OF STUDY: If test results verify study concepts, significant improvements will result in maintenance and distribution policies and procedures for support of deployed combat forces.

PERFORMING ORGANIZATION AND PRINCIPAL AUTHORS: The performing organization was the Office of the Deputy Chief of Staff for Logistics, United States Army. The principal authors were BG Merle Freitag, COL Werner G. Schmidt, Jr., and the 19 members of the three study teams listed on page xxii of the study report.

DTIC ACCESSION NUMBER: DA310272

COMMENTS AND QUESTIONS MAY BE SENT TO: (1) Deputy Chief of Staff for Logistics, Department of the Army, ATTN: DALO-ZE, Washington, D.C. 20310-0530. (2) POC: BG Merle Freitag, AUTOVON 224-4392.

START DATE: 13 May 1985

COMPLETION DATE: 10 October 1985

END

12-86

DTIC